Community participation: exploring legitimacy in socio-ecological systems for environmental water governance

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Abstract

Environmental water governance is a highly contested space in which the legitimacy of institutional and legal models for water managing relies heavily, but indirectly, upon the effectiveness of community engagement. Accordingly, this article explores the relationship between legitimacy and participatory forms of decision-making in relation to public institutions with responsibility for environmental water governance in Australia. This examination explores the role that law and systems theory, working as transdisciplinary, theoretically informed praxis, can bring to an understanding of socio-ecological systems for environmental water governance. The Olifants River case study in South Africa provides a counterpoint to the investigation of environmental water institutions in the Murray–Darling Basin in Australia. As a grounded analysis of emergent forms of community engagement, the South African model illustrates how systemic affordances can introduce greater flexibility and choice, and thereby enhance the legitimacy of environmental water governance.

1. Legitimacy and Participation in Environmental Water Governance

1.1 Introduction: Exploring Legitimacy

Legitimacy increasingly features in the vernacular of Australian policy discourses that designate environmental water governance, institutional reform and community participation as a wicked problem. Significant ambiguity attends the nature of legitimacy in this context – not least in defining the relevant institutions and community. Surprisingly, there is no settled understanding of what is comprised by

legitimate community participation in decision-making in water governance. Accordingly, this article explores the relationship between legitimacy and participatory forms of decision-making in relation to public institutions with responsibility for environmental water governance in Australia. The analysis draws on socio-ecological systems theory where 'the enacting of governance is best understood as theory-informed practice, or praxis' (Ison 2017a and Ison 2017b).

The analysis charts systemic failures in public institutions which embed narrow conceptions of community participation but also the potential of emergent organisational models in environmental water governance that hold the potential to better facilitate adaptive and inclusive community involvement. To demonstrate such potential, we reference a comparable case study in South Africa to explore the viability of a co-evolutionary social learning praxis where the 'community' exists both 'within and without' the water institutions. In exploring these co-produced institutional-community relationships, we ask - what are the prospective models for understanding legitimacy in environmental water law and governance? What might systems-based understandings offer that other forms of community engagement may not? What links are there between legitimacy, and flexibility in governance responses, as captured through the concept of affordances? Before turning to these issues, we analyse the links between legitimacy, law and participatory forms of water governance.

1.2 Legal Framings around Legitimacy in Water Governance

Water has multiple social and ecological dimensions, it is the subject of contested human uses and values, as well as generating conflicts over its allocation and the nature and extent of environmental restoration efforts. Given the contested nature of water governance generally, community participation in environmental water law and

governance, by extension, represents a complex interface between law, institutions and 'the community' – in short, a coupled socio-ecological system.

In seeking to analyse legitimacy as an emergent property of a bonded socio-ecological system known as 'environmental water governance' we draw on a trans-disciplinary methodology that brings together law and systems theory. It comprises first, legal theories that reference socio-legal, pluralist and empirically-grounded accounts of law (Graham, Davies & Godden 2018) and theories that seek to explain the normative i.e. legitimising effect of law (Tamanaha 2006). It also comprises a body of systems theory and social learning practice (Ison, Blackmore and Iaquinto 2013 Ison, R., C. Blackmore, and B. L. Iaquinto. 2013) in which water governance exists as a contextual, dynamic and relational process between the human and biophysical worlds, and where such forms co-evolve (Ison 2017). This transdisciplinary praxis has been developed by the current authors focused on community participation in water governance and policy/institutional transformation (see e.g., Rubenstein, Ison, Wallis and Godden 2016).

Complexity theories are an integral component of systems perspectives with increasing application to environmental governance. In environmental water governance, this complexity is heightened due to the relatively recent formation of institutions and organizations with responsibilities for environmental water and given the crisis narratives of severe drought and climate change impacts in which they were established. (Ison, Alexandra and Wallis 2018).

In Australia over the first decade of the 21st century non-government organisations, industry, scientific experts such as the Wentworth Group, and increasingly the media, advocated for the Australian, Commonwealth government to respond decisively to the water crisis precipitated by the Millennium drought. Technical

and engineering solutions re-emerged, albeit at a smaller scale from the previous era of dam building, to offer efficiency-based resolution of the water sustainability crisis (Crase et al. 2009) with on-farm irrigation and river improvement works. Politically, it was framed as a crisis of governance and governments, the failure of successive state governments to work collectively to resolve overallocation of water in the Murray-Darling Basin (Alexandra 2012). The Howard Government responded with its signature policy format with a ten-point water plan (and the later Labor government extended the plan and funding) that saw the enactment of new water legislation. The Water Act 2007, which relied on indirect legislative powers, including giving effect to Australia's international obligations for environmental sustainability, instituted a new Commonwealth agency – the Murray-Darling Basin Authority amongst a raft of measures aimed at reducing water overallocation and achieving sustainable use of water.

The measures were deeply contested at the height of the drought, and even more so in the 'post drought' crisis period where perceived failures of community participation were identified as undermining the credibility of institutional governance (O'Donnell et al. 2017). Multifaceted legal and policy challenges arise in gauging the legitimacy of community participation beyond that crisis, and of the institutional measures that best mediate and support community participation. An enquiry that traces the institutional memory in respect of the evolution of environmental water governance is important, as, '[w]ithout memory, there is no context or continuity for current decisions', (Tingle 2015: 4).

'Environmental water governance' we take to refer to the complex of national and sub-national (state and territory) water-related legislation, legal rules and caselaw principles, sitting within a wider framework of policy, institutional technologies and

social practices that are coupled with a biophysical system (See also Alexandra 2018, 114). In Australia, environmental water governance also operates within a federal structure, based on a constitutional division of legislative powers between Federal, and State and Territory governments that is given policy expression through the Council of Australian Governments (CoAG).

In this complex legal and policy context, legitimacy offers scope to explore new framings of community participation in decision-making around environmental water. As a guiding principle for evaluating adaptive water governance, legitimacy is not limited to the immediate resolution of disputes; its primary impetus for adoption to date. Potentially, the term speaks to the inculcation of an active and inclusive community participation in water governance (Garrick and O'Donnell 2015) where 'feedback' is an integral component. Legitimacy, in the extended sense developed here, also offers a means of assessing the resilience and adaptive capacity of environmental water governance models (Garrick, D.E. and De Stefano, L. 2016).

1.2.1 Legitimacy and Rule of Law

The etymology of 'legitimacy' reveals its links to law. Its conventional definition refers to the exercise of rightful authority; that is the legitimate exercise of power according to law (Waldron 2008). While comprehending a complex set of rules and institutional conventions and practices, it is aligned to 'rule of law' generally, and to the resolution of specific property law and resource conflicts (Waldron 2012). In western legal systems, the rule of law has long been invoked as a denominator of lawful (legitimate) authority. A society governed by the rule of law is to be distinguished from a situation where unconstrained, and potentially illegitimate powers are exercised by governments. Most relevantly in respect of water governance, the rule of law is invoked in societies to require public officials to act in compliance with, and to enforce the law

(Gowder 2016). Recently, the roll-back of statutory law and legal protections in many spheres of social and environmental policy, together with the increasing use of executive powers (or the failure to take appropriate action to address breaches of law) has generated a resurgence in the advocacy of democracy and rule of law concepts - if not always their successful implementation (Lindsay and Jaireth 2016).

Alternatively, the enhanced advocacy of compliance with the rule of law might be attributed to the need to draw a 'bright line' between law and other forms of behavioural change as the deregulatory state in modern democracies adopts a spectrum of normative (soft law) informational and consumer preference measures to institute policy positions and to initiate social change that shifts the emphasis from earlier, more formal, modes of legal accountability.

Water security indicia similarly evaluate the extent to which water governance meets policy objectives and targets (Cook and Bakker 2012), and such measures are informed by considerations of compliance, and thus legitimacy. In Australia, the capacity of legal and regulatory structures to set an appropriate, sustainable balance between consumptive water use and environmental water requirements is critical to the long-term viability of ecosystems over much of the continent. Issues of legitimacy in water governance are most frequently invoked in determining that balance, and in gauging the validity of institutional actions taken to achieve those outcomes (Alexandra 2018: 114).

1.4 Legitimacy and Compliance

In seeking to balance competing demands, environmental water institutions are subject to the principles of administrative law that require the accountability and transparency of government agencies in the application of laws. Nonetheless, a perceived gap exists between what law 'on the books' seeks to achieve and what it

delivers in practice, which has led to a focus on the effectiveness and accountability of agencies in implementing law and in changing environmentally-harmful behaviours (Martin and Kennedy 2016, Martin and Craig 2015). Compliance has become an important indicator of the legitimacy of institutional actors.

In 2017, allegations arose about serious non-compliance with the conditions for water extraction in water access licences in the northern Murray Darling Basin in New South Wales (NSW). Investigations occurred into breaches of water licences by the Strategic Investigations Unit (responsible for compliance) within the relevant NSW water agency. The unit's findings about meter tampering and over-extraction by the licensee were not enforced by NSW government (Carmody 2017). Subsequently, several inquiries examined how compliance with water allocations was managed across the Basin, including a South Australian Royal Commission tasked with examining state compliance with the Murray-Darling Basin Plan itself (Murray-Darling Basin Royal Commission 2018). The exposé of the failure of the NSW government agency to secure compliance represents a classic scenario of a rule of law deficit. The public and political reaction to 'water theft', alongside the institutional failure to ensure a transparent and accountable water allocation system, drew calls for stronger enforcement and adherence to law – i.e. that agencies act according to the 'rule of law'.

2. New Institutions for Environmental Water Governance

At one level then, the rise of legitimacy in environmental water governance and rule of law concepts, is a manifestation of well-established forms of legal constraints and safeguards in respect of the exercise of powers by governments and statutory agencies. These requirements although narrow and conceived in negative terms as constraining public institutions remain significant. Despite governance shifts to the private sector in many countries, the core decision-making powers in water law in

Australia largely remain the preserve of statutory authorities, such as the Murray-Darling Basin Authority and state water authorities. To facilitate trans-jurisdictional implementation of environmental water holdings, the Water Act 2007 established a new institution – the Commonwealth 'Environmental Water Holder' (CEWH). Victoria followed suit with the Victorian Environmental Water Holder (VEWH), (O' Donnell 2012). A suite of public and private institutions specifically dedicated to environmental water governance has emerged (O'Donnell 2017; Owens 2016, 2017).

In effect, these environmental water institutions, amongst the first in the world, reflected systemic governance shifts whereby large centralised agencies were supplemented by specialist agencies targeted to a new regulatory subject – environmental water. Issues of legitimacy and community participation in water governance in Australia therefore transcend two levels of public institutions, with distinct if overlapping legal objectives and mandates.

Moreover, even when water institutions are subsequently privatised, and one might expect greater community accountability, the degree of participatory community access will largely depend upon the legal models that are entrenched. For example, community water trusts may adopt more explicit community models (Owens 2017) as compared to commercial utility sector companies (Bakker 2012). In commercial water organisations, the inaccessibility of decision-making in terms of effective community participation can be retained or even increased. Third party mediators, such as consultants, then begin to play a critical role as surrogate community actors (Lange and Cook 2015) even though the community at large may be largely excluded from participation.

2.1 Legitimacy and Public Institutions in Water Governance

If we focus on public institutions for water governance, the mandate of these statutory authorities with responsibility for environmental water governance increasingly is linked to specific legal requirements for community 'participation'. Such participation can exist along a spectrum from simple information provision and/or consultation, or more unusually, to actual shifts in the powers to make key decisions. More broadly, such agencies are accountable to a constituent 'community' through compliance with statutory law provisions which guide decision-making at various levels of prescription (Water Act 2007). Historically in Australia, direct community participation in water management has not been a prominent aspect, other than through 'stakeholder' participation as water 'users' and through representative organisations such as drainage and irrigator boards and trusts (see e.g. Drainage Areas Act 1958 (Vic); Water Act 1989 that establishes local consultative committees).

2.1.1 Which Actors are Legitimate?

Specific models of environmental water allocation and governance also set categories which determine legitimate actors in the environmental water sphere (Horne, O'Donnell and Tharme 2017). Such categories have expanded to include commercial (market) and industry sectors, non-government organisations, alongside the traditional categories of public officials (O'Donnell 2017). In parallel, social movements have aligned ecological sustainability with human rights claims for expansive public participation in natural resource management. The 'duty' to enhance sustainability has formed a rationale adopted by civil society organisations to press for inclusion in environmental water governance. Simultaneously, the emergence of social licence concepts has required industry and businesses to legitimate their continued exploitation of the environment by seeking a mandate from the community (Preston 2015). A

spectrum of third parties now argue they have legitimate goals to pursue and legitimate grievances to be considered by governments and agencies, within the mandated participation processes and through novel forums, such as social media.

While new actors press for inclusion, the 'institutional field' for emergent entities is rarely a tabula rasa. Efforts to implement community-based catchment management organisations, for example, have been a long-term experiment in environmental governance in several Australasian jurisdictions (Curtis et al. 2014). Such models predate the structural water law reforms in the Murray-Darling Basin. Early catchment-based reforms in contrast to the interventionist model of CoAG reforms were 'bottom up', with the momentum for new laws and sustainable approaches coming from landowners and local communities concerned about local land and water degradation (Nelson 2005). Wallis and Ison (2011) however, demonstrated just how complex the institutional 'ecology' was for a Catchment Management Authority (CMA) team in Victoria trying to do its work. Given the historical entrenchment of institutional practices in that ecology, new entrants into this field may enhance, constrain or have little effect on the resultant institutional structures and practices, and more importantly, the phenomena the institutions were designed to address.

This reveals an inherent tension in the institutional ecology. In democratic legal systems, such as Australia, the public interest in water is held to be subsumed by the vesting of the resource in governments, with consequent state control over water - including its distribution to third parties. This formulation of the public interest was reconfirmed by the High Court in *ICM v Commonwealth* (2009 [52-56]). Nonetheless, the water reform agenda that commenced in the Murray-Darling Basin in 1994 altered that model of public interest water law in a significant way with the introduction of a cap and trade model of governance, and water markets (Fisher 2006). The subsequent

legal changes crystallised a specific form of community participation in water governance as predominantly the preserve of the 'economic' (Hanemann, (2006).

The form of community participation that arose at that time is dominated by, 'economic actors holding access (property) rights to water, within the community of entitlement holders and accompanying institutions' (Lindsay 2016, 236). The group comprises individuals and other entities, such as companies (and in some instances, environmental water and rivers themselves), that have legal personality and capacity to hold water entitlements (O'Donnell 2017). These legal entities participate in water governance through an 'economic' relationship with the water resources. It is 'use and consumption' via legal entitlement that legitimates and substantiates their status as water users, and thus, as significant stakeholders in the water governance 'community'. An earlier representative model of community participation based in local representative committees, that had been initiated in the state-based water laws, while not entirely displaced, was adapted, and combined with the putatively, self-actualising model of market-based management (Lindsay 2016). The changes were ushered in by a raft of CoAG water legislation introduced into south-eastern Australia by the 'tied grants' model of water reform adopted by the Commonwealth government from the late 1990s and into the early 21st century (Fisher 2011).

These two prevailing models of community participation in water governance can be matched to the 'turn' to community consultative and to market-based approaches in general environmental and natural resources management. These approaches form pillars in the 'architecture' of contemporary regulation and governance (Gunningham 2009). Within the MDB reform process and in localised water regulation, earlier representative forms of community engagement were retained or adapted to new purposes. Examples can be found in the catchment-based representative committees that

decided water 'sharing' under water resource plans in Queensland and New South Wales (Gardner et al 2017). These forums for community participation proceeded on a blended representative and stakeholder model that included water industry users, environmental NGOs, local industry groups, such as tourism operators, and recreational users such as fishers (see Foerster 2008 for NSW (2008) and 2012 for Victoria). Across the representative and user models of community participation as they evolved, there was an exclusion of Aboriginal people from the constituent community (Jackson and Barber 2013). There has been a belated movement to include Aboriginal people. The Murray-Darling Basin Plan (delegated legislation) has adopted a more comprehensive model for Indigenous peoples' consultation, see the Basin Plan 2012 and Jackson, Tan, Mooney, Hoverman and White 2012). To date, while active partnership models for some First Nations exist, Aboriginal peoples' participation in water governance has largely been addressed in a procedural, consultative model rather any more substantive shift in decision-making powers (Marshall 2017).

2.2 Models of Legitimate Community Participation

The legal requirements for community participation in water governance are generally set down under legislation, and involve various forms of community information sharing, engagement and consultation (Tan et al. 2012, 39). While information-sharing and consultation are well established forms of institutional engagement, especially in water planning, consultation models often fall well short of comprehensive public participation (Lindsay 2016, 326). The specific procedures for implementing community participation often is open to agency discretion, subject to overarching normative principles.

In Australia, the overarching normative framework for water governance is the *Intergovernmental Agreement on the National Water Initiative* 2004 (NWI). While the

NWI guidelines are pervasive in influence, the Agreement itself is of a non-binding legal character. The Water Act 2007 enacted during the later stage in the water law reform agenda, as the Millennium drought deepened, is more directive as to the nature of community consultation and participation. The statutory requirements are most prescriptive around critical aspects of the legislation such as the measures designed to address overallocation of water through 'the long term sustainable diversion limits' (s23, 23AWater Act 2007). More comprehensive and inclusive legislative models for community participation in decision-making are apparent in specific institutions designed for environmental water governance (see CEWH and VEWH legislation).

Beyond prescriptive regulation, the manner of determining legitimate community participation in environmental water governance largely still rests on the two ideations of the community-water relationship. Typically, the modified representative stakeholder model has a statutory basis with nominated categories of peoples who must be included in environmental water governance. The water users/holders model has a legislative basis in the generic identification of entitlement holders, and in the Murray-Darling Basin it is largely referable to the administration of water markets (O'Donnell 2017). In parallel, it is the interactive, co-evolving relationship between community stakeholders, and representative entities, with the public institutions of water governance that animates the perception of 'legitimate' action by water authorities, statutory agencies, and the CEWH and VEWH. In the absence of formal legal criteria to gauge the effectiveness of community participation though, the legitimacy of community participation processes may be 'tested' politically by community protest.

3. A Toolbox for Legitimacy

Within the Australian legal system there now exists a rule of law 'toolbox' of legal principles, statutory models, legal doctrine, institutional arrangements and detailed regulation that determine in specific legal contexts what constitutes legitimate community participation in environmental water governance. Yet, in several key aspects this model retains and entrenches a narrow conception of legitimacy premised on conventional legal models that maintain the centrality of statutory institutions and agencies - albeit with some extensions to representative groups. Even so, such institutional models rarely devolve the actual decision-making power around critical aspects such as water allocations to community stakeholders; let alone open such decisions to a more widely-conceived 'community', other than through the political process. Political analyses point to the expansive informal influence of stakeholder groups and to the lobbying exerted on the political process to achieve the outcomes consistent with the interests of given stakeholders (for MDB see Connell and Grafton 2011 and Alexandra).

To avoid the paralysis of overtly political stakeholder conflict in environmental governance, there have been efforts to develop a model institutional change that references democratic pluralism/pragmatism. At its core, this approach to community-oriented governance seeks to legitimise policy settings by grounding them in community norms that have valence beyond the party-political process. It emphasises that 'public action in the form of policies, regulations and programs should not be delivered … as completed acts of authority descending with omnipotent intentions' (Considine 2005, 3). In more instrumental terms, this approach seeks to inject a bottom-up style of governance into environmental problem solving (Wallington and Lawrence 2008). From a philosophical standpoint, it adopts deliberative justice and equity

measures as a necessary component of environmental governance. While more apparent in environmental law, legal pluralism has made some inroads into water governance.

The legitimacy of organisations that function as environmental water holders, rests in part on an implicit appeal to democratic pluralism and deliberative justice. This appeal is most evident in the novel subject of regulating environmental water. Consequently, that subject of regulation brings an expanded frame for determining legitimacy for these institutions. It draws on intangible relationships between people and water that encompasses diffuse forms of community concern around water sustainability. These concerns are not necessarily linked to specific stakeholder, user or political positions. The current attention to rights for rivers that references Indigenous peoples' cultural values and their laws that accord legal personality to natural features are indicative (Morris and Ruru 2010). These two strands converge, as the values of deliberative justice that promote cultural and environmental integrity for rivers, have required innovative institutional forms to support them (see e.g. Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 (NZ)).

3.1 Systemic Failures of Public Policy

Yet, while the newer environmental water agencies and institutional arrangements may offer more responsive and imaginative organisational frameworks, many are still subject to relatively rigid forms of regulation [state or market] that normalise existing practices around decision-making. Such institutions still operate largely within the bounds of the stakeholder and/or representative forms of community participation. Many engagement, consultation and participation measures are constrained financially, and by the tacit need to work around the political sensitivities in constituent communities and stakeholder groups. Even perceptive, well-designed and community intuitive approaches need to surmount the competing demands on

community time and priorities. Such factors limit opportunities for shared social learning. Many prevailing models of community participation tend to assume a well-informed and active community sector that can evaluate the legitimacy of institutional actions against criteria that are informed by pertinent information. Recent community surveys have revealed large gaps in community knowledge about environmental water holders and the functions they play in environmental protection. Subsequently, efforts have been made to increase community knowledge about environmental water concepts in order to build trust in and the 'legitimacy' of such institutions (VEWH http://www.vewh.vic.gov.au/).

By contrast, environmental water institutions still draw on forms of knowledge production and dissemination, such as modelling, that were initially developed in large government agencies in order for the 'objectivity' of science to support administrative decision-making (Jasanoff 2012). These modes of techno-rational thinking are deeply ingrained. Indeed, Head and Alford (2014) suggest that 'the working mechanisms of the public sector—its characteristic ways of making decisions, organizing, financing, staffing, and controlling' are not readily adaptable to solving wicked problems but require more collaborative forms of interaction and a reformed managerial infrastructure. Moreover, within many public institutions there is a strategic re-entrenching of the boundaries between scientific knowledge about the environment and the subjectivity of policy and decision-making that must demonstrate legitimacy in political and social terms. Lay, tacit or 'community knowledges' cannot be easily accommodated under this boundary-setting where the legitimacy of information largely hinges on scientific objectivity - unless it is channelled through established categories of community actors.

Alternatively, Jasanoff (2012, 105) highlights that boundary-defining language (i.e. such as legitimacy) not only serves the immediate interests of social and political groups, but, 'through the creation of new conceptual categories, opens the way for extending those interests to new or larger domains'. The use of the language of legitimacy in water governance is an important strategic boundary setting tool for environmental water governance institutions that rely in large measure on scientific objectivity. It also has potential use by other community groups, such as industry and environmentalists, who have a stake in the way power and information is distributed among the community and administrative authorities (Jasanoff 2012, 106).

In summary, the classic understanding of water governance institutions tends to cluster on the left-hand side of Figure 1 below.

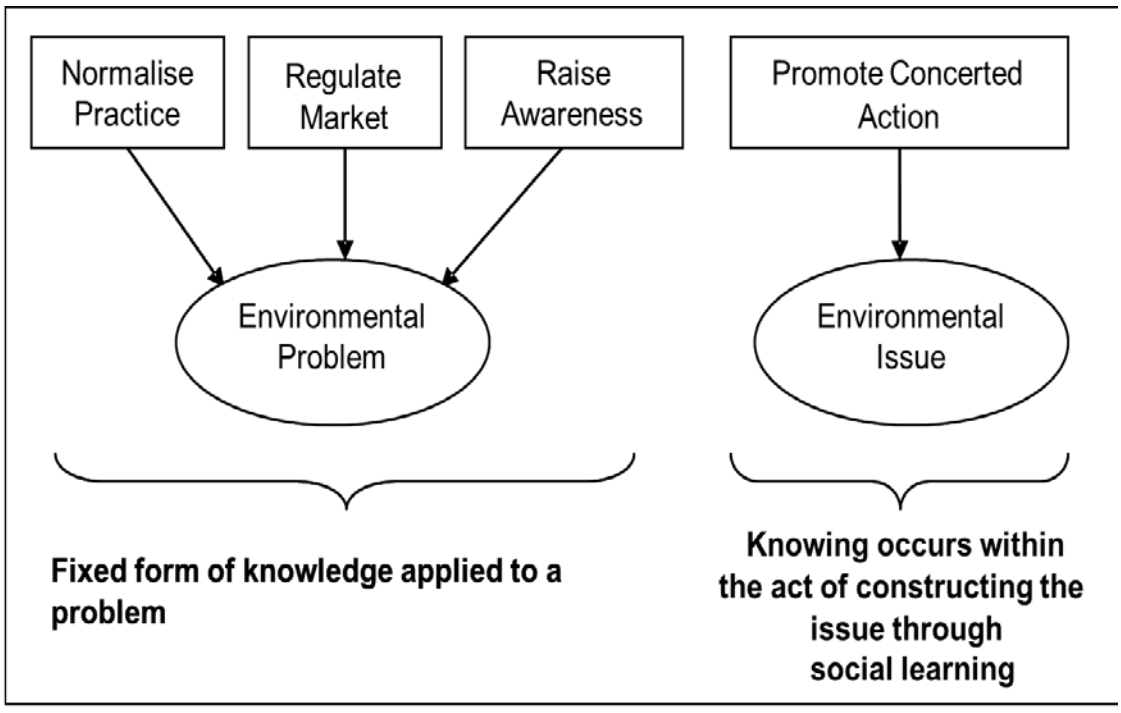

Figure 1 Problem Framing. (Source: Adapted from Ison, Röling, and Watson 2007).

The challenge for institutions engaged in environmental water governance in Australia is to achieve greater legitimacy in the community participation process by shifting the parameters of the institutional organisation toward the attributes clustered on the right-hand side of the diagram (see Figure 1). The conceptual models in Figure 1 should not be read as an either/or choice, but evidence suggests starting out with understandings and practices from the right, rather than the left, opens up more choices for both people and the environment (Ison 2017a). Social learning thus involves a collaborative and progressive identification of issues to be resolved by concerted and agreed action rather than a determinant problem to which established parameters of knowledge and regulation are applied. The mainstream approach (left side in Figure 1) leaves little scope for genuine community engagement and a process of mutual learning within and without the institutions/organisations charged with governance. A shift to social learning institutionalises capability where it can be more responsive to localised complexity and uncertainty – conditions exacerbated in the future by climate change.

4. Framing Environmental Water Governance

4.1 Crafting New Institutions

Transformation towards knowledge grounded in social learning has gained some ground in water governance. New interrelationships have appeared (and continue to evolve) between the governing frameworks of law dealing with environmental water, and the community actors whose participation in governance has been enabled. The numbers of people, institutions and organisations involved in environmental water governance has expanded exponentially. Significant gains have been made in environmental water recovery in the Murray-Darling Basin, although legislative changes subsequently reduced volumes to be recovered in the future by the CEWH. The

viability of environmental water holdings in the Basin is highly dependent upon the tightrope of federal political consensus, even though ecological indicators point to a continuing environmental decline in surface and groundwater systems.

Further, despite the development of an extensive framework of laws, regulations, and guidelines, the mandated process of community participation often does not match well with the reality of 'hollowed out' institutions, resource constraints, information gaps and the political uncertainty that surrounds much decision-making in environmental water governance despite explicit reliance on modelling, metrics and quantification and expert scientific opinion that legislation mandates (Ison, Alexandra and Wallis 2018). Other sites of experimentation with environmental water governance (Yarra River Protection (Wilip-gin Birrarung murron) Act 2017) offer innovative and inclusive models of community participation that potentially avoid the entrenched conflicts that have characterised the Murray-Darling Basin (O'Bryan 2017 75-6). Hybrid forms of environmental protection and water governance are progressively de-centring conventional models of public water institutions in terms of how laws are implemented (Martin and Kennedy 2016). Changes occur as much through praxis, as through legislative reform to water laws and institutional settings. In turn, the rise of legal models grounded in contract, partnerships and community trusts has encouraged transitions to private sector modes of water management, and at least nominally to 'community-based' governance. These trends pose challenges for how environmental water governance is framed; what it addresses, what knowledge forms are accepted, and most significantly for how community groups are included in decision-making.

4.2 The Legitimacy 'deficit': Towards Inclusive Community Co-Governance

If the rationale for determining legitimacy in environmental water governance is to facilitate concerted action between public institutions, and the community, then we

need to critically evaluate whether emergent practices in the Australian context offer viable alternatives. As Heinz von Foerster (1992) notes, '*act always so as to increase the number of choices'*. Increasing choices should extend to a reassessment of the predominance of an institution-led model of reform and social change within the existing regulatory and institutional arrangements for environmental water governance. When initiating and sustaining systemic change, it is not sufficient to simply look to institutional leadership for sustainable change. To initiate wider sectoral and community-focused change, it is also necessary to have engagement with and the participation of a critical mass of actors who acknowledge the need for change, and who are prepared and able to act (OECD 2017). In short, our understanding of community participation in environmental water governance can benefit from problem framing and social learning (see Figure 1) within a model of a cyber-systemic praxis (see Ison et al 2018; Ison 2016; 2018, where this term is explicated. The term is derived from two intersecting theoretical and methodological traditions, namely second-order cybernetics and systems science). These lineages – of cybernetics and systems science – are highly relevant to environmental water governance given their concerns with feedback dynamics based on systemic, rather than systematic, thinking and practice. Similarly, this dual lineage also highlights the relevance of these approaches to governance/governing innovation given the foundational cyber-systemic metaphor based on the Greek verbs kybernao/kybernan meaning 'I steer/to steer'.

5. A Systems Perspective on Legitimacy for Public Institutions

The aim in adopting a systemic perspective is to provide a more holistic approach designed to overcome the community/institutional/environmental water divide by creating 'a community inside and outside of the public sector around complexity and

systems thinking who will discuss the potential of using different systems approaches in the context of public challenges' (Observatory of Public Sector Innovation 2017).

From a systems perspective, water governance exists as a contextual, dynamic and relational process between the human and biophysical worlds that can be contrasted with conventional 'top-down' scientific processes (Ison and Wallis 2011; Ison and Wei 2017). The ongoing degradation in the ecological health of catchments and groundwater sources can be regarded as an emergent property (or outcome) of current and historical water governance arrangements involving multiple inter-related stakeholders on different scales (Ison and Wallis 2011; Wallis and Ison 2011). The failure to improve the ecological condition of water in Australia is in part a failure to recognise that human participants – stakeholders and institutions – do not just operate alongside and respond to ecological 'problems' but are active participants in shaping and changing the system (knowingly or unknowingly) through their interactions, and thereby affecting the response to 'the problem'. Adapting to the challenges of current complex water issues requires recognition of the socially constructed nature and multiple framing choices that may potentially be available in any community participation scenario.

If a socially iterative systems praxis ('theory informed practice') offers the potential for increasing the legitimacy of environmental water governance, then current modes should be assessed as to whether key elements of that approach form an embedded part of current processes. When evaluated in relation to the indicia identified by cyber-systemic praxis, some apparent failings in the current modes of water governance include a situational framing failure that is typically narrowed down to a high conflict consumptive water versus sustainability trade-off – an unhelpful binary choice (Ruiu, Maurizi, Sassu, Sedaiu, Zuin, Blackmore and Roggero 2017). Indicative of such framing failure are practices and understandings that implicitly or explicitly

frame river catchments as hydrological, engineered, ecological or agricultural systems rather than coupled social-ecological or social-biophysical systems. A shift to the latter makes possible three inter-related possibilities: (i) an awareness (that underpins Figure 1), that knowledge does not precede action but arises as knowing in acts of constructing what is at issue. From these acts of constructing what is at issue, the possibility of concerted action emerges; (ii) avoiding starting conditions that predispose toward a linear program for problem analysis and resolution, i.e. in a systematic rather than systemic unfolding over time; and (iii) practices and institutions that seek to improve or sustain, the co-evolutionary dynamics between the social and biophysical (Ison 2018).

Further, failures include emphasising and using institutions (e.g. targets) with systematic as opposed to systemic affordances (see discussion below) and imposing a blueprint onto the situation rather than being open to multiple, partial perspectives in a processes of systemic co-inquiry and co-design, e.g. empowerment and co-production strategies (Ison et al 2018: 10). The importance of co-inquiry, co-design and co-production in environmental water governance are that the discredited linear innovation/adoption/implementation model is avoided and localised capability is developed that satisfies Ashby's Law of Requisite Variety– 'only variety can manage variety' (Ashby 1958). Situated variety management is likely to be one of the few viable strategies to deal with uncertainty in a climate-change world (Ison 2016).

The adoption of such deliberative mechanisms by institutions and stakeholders can engage multiple perspectives in ways that can open up, explore, reveal and acknowledge differences in knowing practices, and thus understanding without the need/ pressure to find 'agreement' or ready-made 'solutions'. Through the act of deliberating in a purposeful way, new knowledge and understandings (social learning) can emerge which may produce the conditions to transform the situation and,

potentially, lead to a more desirable – or sustainable – form of water governance. Therefore, in order to shape adaptive and transformative change, we need to invest in the capacity of governance actors to work purposefully and collaboratively (Collins and Ison 2010; Patterson et al 2013). Patterson, Smith and Bellamy (2013) explore the notion that praxis can be enacted across water catchments through investment in developing "enabling capacities" that underpin practical action. These enabling capacities - including prior experience and contingency, engagement, collaboration, vision and strategy, knowledge building and brokerage – cannot be delivered from the outside but need to be generated in context and at multiple governance levels.

5.1 Systemic affordances

An integral component of contextual and multilayered governance is systemic affordances in framing governance choices. The concept of affordances originates from ecological psychology; it was proposed by James Gibson (1977, 1979) to denote action possibilities provided to the actor by the environment - between a policy and a context; between an institution and a practice; between a (social) technology and a user. When understood systemically, institutions or 'social technologies' (as reframed by Ison, 2017) can be said to have 'affordances'. In the late 1980s Norman (1988) suggested that affordances be taken advantage of in design. The suggestion strongly resonated with designers' concern about making possible uses of their products obvious immediately, and soon the concept came to play a central role in interaction design and Human-Computer Interaction.' (Interaction Design Organisation 2018).

In terms of environmental governance, it is possible to explore the affordances between a policy and a context; between an institution and a practice and between a (social) technology and a user. Such explorations into the affordances of social technologies can provide insights into the systemic functioning of public institutions

responsible for managing environmental water. The implications for how we might better align legitimacy to social learning in complex interactions between institutions and communities in water governance is developed further in the following case study.

5.2 Implementing a Systemic Model: South Africa

A case study of South Africa's experience in instituting environmental water is pertinent to Australia as the institution of environmental water in both nations is relatively recent. The two nations virtually simultaneously developed legal frameworks for manging environmental water, with synergies and borrowings between the two countries given the very similar climatic and water scarcity challenges each country faces.

In South Africa, the RESILIM-O project, based in the Olifants Catchment, is funded by the U.S. Agency for International Development (USAID) under its Southern Africa 'Resilience in the Limpopo basin program' (RESILIM). It has been implemented by the Association for Water and Rural Development (AWARD), in collaboration with partners. AWARD have adopted innovative features that resonate with the arguments advanced above. In the first instance, they have been consciously attempting to break out of the dualism of seeing rivers as natural, ecological or biophysical systems OR social systems. Instead they have framed the catchment as the structural coupling of two systems – a biophysical and a social system on a 'co-evolutionary journey' (Figure 2).

Figure 2. A coupled social and biophysical system with the co-evolutionary dynamics mediated by human-invented institutions and technologies (Source: Developed by Ison for the CADWAGO Project http://www.cadwago.net/- Accessed 10th May 2018)

In this framing the co-evolutionary journey, over time, of the two systems is mediated by human-invented institutions and technologies such as 'environmental water' or, in the case of AWARD, the possibility of reinventing itself as a new form of organisation, able to mediate Catchment, between the state (i.e. the main arm of vertical governance) and civil society (the main arm of horizontal governance).

In this conception AWARD and the project 'RESILIM-O' are both human invented institutions that mediate the relations between the social and the biophysical in the context of the Olifants River. The recent development of a 'real-time app' for reporting on environmental flows in the Olifants is an example of success that AWARD is achieving under this reframing. RESILIM-O work in 2016/2017 took place during the worst drought on record (2015-2016) and the hottest temperatures on record with significantly more 'hot days' (exceeding 40°C) than in the previous drought. In terms

of water governance and the use of their tools, it is therefore significant that flows in the Olifants River were maintained even though they declined to precariously low levels in September 2016 and again in August 2017. This can be directly attributed to the RESILIM-O work undertaken in partnership with other stakeholders (SANParks) and key directorates within DWS (Department of Water Services). This stands in contrast to 2005 when the Olifants stopped flowing for 33 days - the first time on record (AWARD 2018). Importantly this innovation by AWARD had both technological and social elements, but neither the technology, nor the effective action in the social/political domain would have been possible without the capacity of AWARD and its staff to function as a mediator/facilitator of social (community) relations at the same time as being a technological innovator. This is exemplified further in their pioneering work with systems-dynamics-based design of co-modelling approaches with stakeholders to develop and enact policy (Clifford-Holmes et al. 2016).

The RESILIM-O case exemplifies how institutional form and praxis combine to create legitimacy, especially when historical forms of legitimacy in water governance are failing. State capture has undermined the capacity of institutions and state-based practitioners to effectively govern the Olifants, including delivering environmental reserve flows to neighbouring Mozambique. Without a catchment-situated organization (AWARD), a network of informal and formal social relations and technologies, practices and institutions (RESILIM-O) capable of delivering reliable, real-time feedback the environmental reserve would not have functioned. The same phenomena are at play in Australia and in the MDB. Tingle (2015) highlights the loss of memory in how to govern effectively at the heart of the Federal system. In addition, recent governance failings and fish-deaths in the MDB point to an on-going crisis of legitimacy in the institutions created through the Water Act (2007).

While the AWARD process has been effective in the social and political domain and thereby gained legitimacy with the community, further questions arise, which are being pursued through an on-going 'systemic inquiry' (Ison 2017). These issues include: (i) what boundaries are in action, or could be in action, for the Olifants social and/or biophysical systems?; (ii) Do the boundaries need to be expanded?; (iii) Is the right baseline data available/being used?; (iv) Is there a need for more investment in demand-pull initiatives to secure the ongoing structural coupling via the AWARD approach?; (v) As climate change hits where are the greatest vulnerabilities going to emerge? and (vi) What can be said about the current trajectory of the Olifants River social-biophysical system? or What are the best trajectory altering levers for the co-evolutionary dynamic? The pursuit of such questions in an open, on-going systemic co-inquiry offers more future choices for catchment–based organisations than the widespread compliance and deliver-to-targets culture.

6. The 'Affordances' of Community Participation in the Australian Context

The South African case study in turn poses questions by which we might evaluate the legitimacy of the mix of laws, institutions, practices and technologies in the socioecological domain that are associated with Australian environmental water governance. Of specific relevance is whether the accepted functions and scope of 'environmental water' and the associated 'offices of environmental water holder' provide sufficient affordances and flexibility for an effective governing of the Murray–Darling Basin? An effective governing should be consistent with an expansive, community-focused rule of law approach – especially given that the challenges in managing water and ensuring compliance with environmental water requirements will be exacerbated by climate change, economic disruption and the precipitous decline in biodiversity. Are these institutions too siloed and the processes too narrowly oriented to

achieve legitimacy with the community? Can the practitioners, the enactors of these institutions, contribute to creating an emergent, effective governing performance that satisfies concerns about legitimacy that lie in the affective dimension of community trust and engagement, well beyond narrow rule of law considerations? These are critical questions moving forward (Ison 2018).

In turn, effective and inclusive community participation in environmental water governance must reconnect with a fundamental conception of community participation, where an expanded concept of the community-water relationships transcends the economic user and representational modes. An expanded community forum that works both within and outside the formal institutional framework can allow for meaningful deliberation around contested questions of environmental protection and sustainable water balances. This ideal of deliberative democracy has become aligned with political and social legitimacy as it is inextricably linked with the public's responsibilities in shaping the co-evolution of socioecological systems through the 'technologies' of environmental water governance. Such a changing political or legal context creates space for the assertion of novel ways of knowing that are also new ways of doing. Expanding the scope of community praxis by reference to how existing water governance models have precluded Aboriginal ecological knowledge about water, for example, may simultaneously begin to repair community relationships with water, empower Aboriginal communities in their participation in water management and planning (Weir 2011 187) and build the overall legitimacy of the water governance system. Similarly, in expanding the horizons of social learning, by opening up the constellation of knowledge practices around environmental water, it elucidates our perspective on the potential of cyber-systemic ways of knowing and acting to reframe critical understandings of governance to better encapsulate community participation

(Ison et al 2018: 12). Further, an expanded social learning context for community engagement and institutional change can provide method, scope and contextual complexity to better ground the concept of legitimacy in the evolving dynamics of engagement between the institutions of environmental water governance and the community.

References

Alexandra J. 2012 Australia's landscapes in a changing climate—caution, hope, inspiration, and transformation. *Crop Pasture Science* 63:215–23.1

Ashby W.R. 1958. Requisite variety and its implications for the control of complex systems. *Cybernetica* 1: 83 - 99.

Bakker, K. 2012. Commons vs. Commodities: Debating the Human Right to Water. in *The Right to Water: Politics, governance and social struggles*, ed. Sultana, F. & Loftus, A., 19-44. Earthscan

Carmody, E. Murray, Darling, What's All this 4 Corners Fuss About? Menadue, J. *Pearls and Irritations* (28 August 2017) https://johnmenadue.com/emma-carmody-murray-darling-whats-all-this-4-corners-fuss-about.

Clifford-Holmes, J. K., S. Pollard, H. Biggs, K. Chihambakwe, W. Jonker, T. York, F. A. Diaz, and J. H. Slinger. 2016. "Resilient by Design: A Modelling Approach to Support Scenario and Policy Analysis in the Olifants River Basin, South Africa." Paper presented at the 34th International Conference of the System Dynamics Society, 17–21 July 2016, in Delft, Netherlands.

Collins, K.B. and R.L. Ison. 2010. Trusting emergence: some experiences of learning about integrated catchment science with the environment agency of England and Wales. Water Resources Management 24, 4: 669-688.

Connell, D. and R. Quentin Grafton. 2011. Basin futures: Water reform in the Murray-Darling Basin. Canberra: ANU Press

Considine, M. 2005. Partnerships and Collaborative Advantage: Some Reflections on New Forms of Network Governance. Centre for Public Policy, University of Melbourne.

Cook, C. and Bakker, K. 2012. Water security: Debating an emerging paradigm. Global Environmental Change 22: 94 -102.

Crase, LR, O'Keefe SM, Dollery BE. 2009. The fluctuating political appeal of water engineering in Australia. *Water Alternatives* 2: 441–444.

Curtis, A, Ross H, Marshall GR, Baldwin C, Cavaye J, Freeman C, Carr A, Syme GJ. 2014. The great experiment with devolved NRM governance: lessons from community engagement in Australia and New Zealand since the 1980s. *Australian Journal of Environmental Management* 21(2):175–199.

Fisher, D. 2006. Water resources governance and the law. *Australasian Journal of Natural Resources Law and Policy*, 11: 1–41.

Fisher, D. 2011. A sustainable Murray-Darling Basin: the legal challenges in eds Connell D. and Grafton R.Q. *Basin Futures: Water Reform in the MDB,* ANU E Press Canberra ch 12.

Foerster, A. 2008. Managing and Protecting Environmental Water: Lessons from the Gwydir for ecologically sustainable water management in the Murray Darling Basin. *Environmental Planning Law Journal* 25, 130.

Foerster, A. 2012. Emerging Environmental Water Governance in Australia. *Journal of Water Law*. Journal of Water Law 22, 58.

Foerster H. von. 1992 Ethics and Second Order Cybernetics. Cybernetics and Human Knowing 1(1): 9–20. http://www.univie.ac.at/constructivism/hvf/137.1

Gardner A, Bartlett R., Gray J. and Nelson R. 2017. *Water Resources Law* Lexis-Nexis North Ryde.

Garrick, D.E. and De Stefano, L. 2016. Adaptive capacity in federal rivers: coordination challenges and institutional responses. *Current Opinion in Environmental Sustainability* 21:78.

Garrick, D., and O'Donnell, E. 2015. Exploring Private Roles in Environmental Watering in Australia and the US. In Bennitt J. (ed) *Protecting the Environment, Privately* 203–231.

Gibson, J. J. 1977. The theory of affordances. In: R. Shaw and J. Bransford (eds.) Perceiving, Acting and Knowing. Hillsdale, NJ: Erlbaum.

Gibson, J. J. 1979. The Ecological Approach to Visual Perception. Boston, MA: Houghton Mifflin.

Gowder P. 2016. The Rule of Law in the Real World. Cambridge, Cambridge University Press.

Graham, N., Davies M. and L. Godden. 2018. Broadening Law's Context in Socio-Legal Research. Griffith Law Review doi.org/10.1080/10383441.2017

Gunningham, N. 2009. Environmental Law, Regulation and Governance: Shifting Architectures. *Journal of Environmental Law* 21, 2: 179.

Hanemann, W. M. 2006. The Economic Conception of Water in *Water Crisis: Myth or Reality?* ed Rogers P. et al. 61–91. Taylor & Francis.

Head B. and Alford J. 2014 Wicked problems: implications for public policy and management. *Administrative Sociology*. https ://doi.org/10.1177/00953 99713 48160 1.

Horne A. O'Donnell E. Tharme R.E. 2017. Mechanisms to Allocate Environmental Water In ed Horne A. et al. *Water for The Environment: From Policy and Science to Implementation and Management* Academic Press.

Ison, R.L. & Wallis, P. 2011. Planning as Performance. The Murray-Darling Basin Plan. In Grafton Q & Connell, D. eds. Basin Futures: Water reform in the Murray-Darling Basin, 399-411. ANU ePress, Canberra.

Ison, R.L. 2016. Governing in the Anthropocene: what future systems thinking in practice? Systems Research & Behavioral Science 33 (5): 595-613.

Ison, R.L. and Wallis, P. 2017. Mechanisms for inclusive governance, In Karar, E. ed Freshwater Governance for the 21st Century, 159-185, Global Issues in Water Policy 6, Springer, Switzerland.

Ison, R.L. 2017a. Systems practice: how to act in situations of uncertainty and complexity in a climate-change world, 2nd edn. Springer-Verlag London.

Ison, R.L. 2017b. 'Tools and examples to build legitimacy. Participatory decision-making and resilient water governance' Presentation, Academy of Social Sciences in Australia (ASSA) Workshop, University of Melbourne, December 2017.

Ison, R.L. 2018. Governing the human-environment relationship: systemic practice. Current Opinion in Environmental Sustainability 33,114-123. https://doi.org/10.1016/j.cosust.2018.05.009

Ison, R.L., Röling, N. & Watson, D. 2007. Challenges to science and society in the sustainable management and use of water: investigating the role of social learning. Environmental Science & Policy 10 (6) 499 – 511.]

Ison, R.L. & Wei, Y. 2017. Watershed systems science—A new paradigm to understand and govern the impact of human activities on the earth's surface in the Anthropocene. Science China Earth Sciences, 60, (12): 2225–2227.

Ison R. L. Blackmore C, Iaquinto BL. 2013. Towards systemic and adaptive governance: exploring the revealing and concealing aspects of contemporary social-learning metaphors. *Ecological Economics* 87: 34–42.

Ison R. L., Alexandra A. and Wallis P. 2018. Governing in the Anthropocene: are there cyber-systemic antidotes to the malaise of modern governance? *Sustainability Science* 13:1209.

Jackson, S. and Barber, M. 2013. Recognition of indigenous water values in Australia's Northern Territory: current progress and ongoing challenges for social justice planning. Planning Theory & Practice 14: 345

Jackson, S., P-L. Tan, C. Mooney, S. Hoverman and I. White. 2012. Principles and Guidelines for Good Practice in Indigenous Engagement in Water Planning.

Jasanoff, S. 2012. Contested Boundaries in Policy Relevant Science. In *Science and Public Reason* 103-116. New York: Routledge.

Lange, B. and C. Cook. 2015. Mapping a Developing Governance Space: Managing Drought in the UK. *Current Legal Problems* 68: 229.

Lindsay, B. 2016. Public participation, litigation and adjudicative procedure in water resources management. *Environmental Planning and Law Journal* 33: 325.

Lindsay, B. and Jaireth H. 2016. Australian environmental democracy and the rule of law-thoughts from APEEL. (2016) *Australian Environment Review* 31: 245.

Marshall V. 2017. *Overturning aqua nullius – securing Aboriginal water rights*. Aboriginal Studies Press AIATSIS Canberra.

Martin, P. and D. Craig. 2015. Accelerating the evolution of environmental law through continuous learning from applied experience. In Implementing Environmental Law, ed. Paul Martin and Amanda Kennedy, 27-49. Edward Elgar.

Martin, P. and A. Kennedy. 2016. Introduction. In Implementing Environmental Law, ed. Paul Martin and Amanda Kennedy, 1-25. Cheltenham: Edward Elgar.

Morris D. and Ruru, J. 2010. Giving Voice to Rivers: Legal Personality as a Vehicle for Recognising Indigenous Peoples' Relationships to Water. Australian Indigenous Law Reporter 14: 49.

Nelson, R. 2005. Legislation for ICM: advancing water resources sustainability. *Environmental and Planning Law Journal 22:* 96-102.

Norman, D. (1988) The psychology of everyday things. New York, NY, US: Basic Books.

O'Bryan, K. 2017. "Giving a Voice to the River and the Role of Indigenous People: The Whanganui River Settlement and River Management in Victoria." Australian Indigenous Law Review 20 (1): 48–77.

O'Donnell, E. 2012. Institutional reform in environmental water management: the new Victorian Environmental Water Holder. Journal of Water Law 22: 73-84.

O'Donnell, E. 2017. Competition or Collaboration? Using Legal Persons to Manage Water for the Environment in Australia and the United States. *Environmental and Planning Law Journal* 34, 6: 503-521.

O'Donnell, E. Horne A. Head B. and Godden L. 2017. *Going Beyond the Crisis Response: Building Trust and Maintaining Legitimacy for all Stakeholders in Environmental Flows and Water Governance, ASSA*

Observatory of Public Sector Innovation. 2017. Innovation in Government: The New Normal. November 20-21, 2017.

Organisation for Economic Co-operation and Development. 2017. System Approaches to Public Sector Challenges: Working with Change. http://www.oecd.org/publications/systems-approaches-to-public-sector-challenges-9789264279865-en.htm

Owens, K. 2016. Reimagining water buybacks in Australia: Non-governmental Organisations, complementary initiatives and private capital. *Environmental and Planning Law Journal.* 33: 342-355.

Owens, K. 2017. Environmental Water Markets and Regulation: A Comparative Legal Approach. Abingdon: Routledge.

Patterson, J.J., C. Smith and J. Bellamy. 2013. Understanding enabling capacities for managing the 'wicked problem' of nonpoint source water pollution in catchments: a conceptual framework. *Journal of Environmental Management* 128: 441-452.

Preston, B. 2015. The Adequacy of the Law in Satisfying Society's Expectations for Major Projects. *Environmental and Planning Law Journal* 32: 182.

Rubenstein, N. Wallis, P. , Ison R. and L. Godden. 2016. Critical reflections on building a community of conversation about water governance in Australia. Water Alternatives 9: 81.

Ruiu, M., Laura, S. Maurizi, S. Sassu, G. Seddaiu, O. Zuin, C. Blackmore, and P.P. Roggero. 2017. Re-Staging La Rasgioni: Lessons Learned from Transforming a Traditional Form of Conflict Resolution to Engage Stakeholders in Agricultural Water Governance. *Water* 9: 297; doi:10.3390/w9040297

Tamanaha, B. 2006. Law as a Means to an End: Threat to the Rule of Law. Cambridge UK: Cambridge University Press. 1–7 doi:10.1017/CBO9780511511073

Tan, P-L., C. Baldwin, I. White and K. Burry. 2012. Water Planning in the Condamine Alluvium, Queensland: Sharing Information and Eliciting Views in a Context of Overallocation. *Journal of Hydrology* 474*:* 38-46

Tingle, L. 2015. Political Amnesia. How We Forgot How to Govern, Quarterly Essay 60, Melbourne: Black Inc

Waldron, J. 2008. The Concept and the Rule of Law. *Georgia Law Review* 43:1.

Waldron J. 2012. The Rule of Law and the Measure of Property, Cambridge, Cambridge University Press.

Wallington T. and Lawrence G., 2008. Making Democracy Matter: Responsibility and Effective Environmental Governance in Regional Australia. *Journal of Rural Studies* 24: 277.

Wallis P. and Ison R.L. 2011. Appreciating institutional complexity in water governance dynamics: a case from the Murray-Darling Basin, Australia. *Water Resource Management* 25: 4081-4097.

Weir K. 2011. Water Planning and Dispossession In: Connell D. and Grafton R.Q. (eds) Basin Futures: Water reform in the Murray-Darling Basin Canberra ANU Press.

Legal and On-line Sources

Academy of Social Sciences in Australia (organisers Erin O'Donnell, Avril Horne, Lee Godden and Brian Head). Going beyond the Crisis Response: Building Trust and Maintaining Legitimacy in Environmental Flows. A National Workshop: Melbourne Law School, Mebourne, Australia 27–28 November 2017.

Association for Water and Rural Development (AWARD) South Africa http://award.org.za/article/olifants-running-on-empty (Accessed 10th May 2018).

Council of Australian Governments (CoAG), *Intergovernmental Agreement on a National Water Initiative* (2004) http://webarchive.nla.gov.au/gov/20041208125822/http://www.coag.gov.au/meetings/250604/index.htm

Interaction Design Organisation Encyclopaedia of Human Computer Interactions. https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/affordances (Accessed 10th May 2018).

ICM Agriculture v Commonwealth (2009) 240 CLR 140.

Murray-Darling Basin Royal Commission (2018) available at: www.mdbrc.sa.gov.au.

Water Act 2007 (C'th)

Water Act 1989 (Vic)

Water Amendment (Victorian Environmental Water Holder) Act 2010 (Vic)

Yarra River Protection (Wilip-gin Birrarung murron) Act 2017